

Remaining Useful Life of Coal-Fired Power Plants

As discussed in comments on the proposed Best Available Retrofit Technology (BART) federal implementation plan (FIP) submitted by the Texas Commission on Environmental Quality (TCEQ) and the Public Utility Commission of Texas (PUCT), the EPA's use of 30 years as the remaining useful life of the coal-fired electric generating units (EGUs) is not realistic given the current age profiles and trends in the electric power sector. The average age of the units subject to the EPA's proposed BART FIP is approximately 40 years. The EPA is assuming that these units will have an average total operational life of 70 years, but this assumption is not supported by the available data for the coal-fired EGU sector. According to the United States Department of Energy, Energy Information Administration (EIA), less than 5% of the United States operable coal-fired EGU fleet in 2015 was greater than 65 years in age and less than 2% was greater than 70 years in age. However, applying the EPA's assumed useful life to the current 41 operable coal-fired EGUs in Texas (18 BART-eligible units and 23 non-BART units), the EPA is effectively assuming that at least 44% of Texas coal-fired EGUs will remain operational past the age of 66 years and at least 12% past the age of 70 years, far higher than the age profile of the national fleet.

As indicated by the EIA's 2015 Form EIA-860 data for coal-fired EGUs with expected retirement dates (i.e., retirement expected after 2015), the average age at retirement is 53 years. Additional research indicates that this average age at retirement is supported by retirement age data from other sources. The average age of coal-fired EGUs that were retired in 2015 was 54 years according to an EIA article (<https://www.eia.gov/todayinenergy/detail.php?id=25272>). Additionally, a January 28, 2013 Power article titled America's Aging Generation Fleet presented SNL Energy data on average fossil fuel plant retirement ages by fuel type (<http://www.powermag.com/americas-aging-generation-fleet/>). According to the SNL data, from 1999 to 2012 the weighted average age at retirement for coal-fired units ranged from 37 to 54 years. The overall average retirement age from the SNL Energy data during this time frame was approximately 49 years.

Furthermore, in addition to historical retirement age data, other factors do not support the EPA's assumed extreme useful life of 70 years for coal-fired EGUs. According to the EIA's 2017 Annual Energy Outlook (<https://www.eia.gov/outlooks/aeo/>), the general trend in declining coal-fired electric power sector capacity is expected to continue even in the absence of the EPA's currently stayed Clean Power Plan. A recent analysis presented by The Brattle Group provided an assessment on the factors impacting the United States coal-fired EGU sector (http://www.brattle.com/system/publications/pdfs/000/005/398/original/Future_of_Coal_Clean_Power_Plan_Market_Drivers_and_Other_Regulations.pdf?1485472914). According to The Brattle Group presentation, in addition to environmental regulatory pressures, the coal-fired EGU sector is largely impacted by low natural gas prices, lower demand growth, and renewables continuing to take a greater share of the electric power generation sector. While The Brattle Group expects that the coal-fired power generation sector may stabilize with higher natural gas prices, the SNL Energy data presented in the 2013 Power article indicates that even the high natural gas prices between 2004 and 2008 did not appear to significantly affect the average retirement age of coal-fired EGUs.

The EPA's assumed 30 years of remaining useful life for the BART-eligible coal-fired EGUs in Texas is arbitrary, unsupported, and fictitiously high. Given the importance of the remaining useful life in cost effectiveness estimates in a BART analysis, any estimate of the useful life of an EGU, and from that the expected remaining useful life, should consider the historical data of the electric generation fleet as well as the current and expected market forces affecting the generation mix. The EPA's use of 30 years for the remaining useful life biases EPA's cost analysis, making it appear that controls are more cost effective than real-world data supports.

Retirements and Potential Impacts on Grid Reliability

As commented by the TCEQ and PUCT on the proposed BART FIP, recent studies by The Electric Reliability Council of Texas, Inc. (ERCOT) indicate some of the units affected by the EPA's sulfur dioxide (SO₂) control requirements for the Regional Haze Rule are likely to be retired rather than the companies install or upgrade controls necessary to comply (ERCOT 2016 Long-Term System Assessment Update,

Attachment 1: Remaining Useful Life of Coal-Fired Power Plants/Retirements and Potential Grid Reliability Impacts

June 21, 2016, slide 4, available at:

http://www.ercot.com/content/wcm/key_documents_lists/77730/2016_LTSA_Update_6_21_2016.pptx).

Specifically, ERCOT expects that Big Brown units 1 and 2, Monticello units 1 and 2, and Coletto Creek would be retired by 2021 (based on installation of new flue gas desulfurization), and that Monticello unit 3 and Martin Lake units 1 – 3 would be retired by 2019 (based on scrubber upgrades). While ERCOT's analyses are actually on the EPA's final Regional Haze Reasonable Progress FIP for Texas, the SO₂ control levels for the proposed BART FIP for these specific units are essentially identical to the finalized Reasonable Progress FIP. Given the current market pressures on the coal-fired EGUs sector, such as those discussed in The Brattle Group presentation noted above, ERCOT's assessment that the companies would retire the facilities rather than incur significant costs to install or upgrade controls is reasonable and more realistic than the EPA's assumption that the controls are cost effective, especially given that the EPA did not appear to give any consideration to the current electric utility sector market factors in their economic analyses for the final Reasonable Progress and proposed BART FIPs.

Additionally, ERCOT's assessment that companies would retire Big Brown units 1 and 2, Monticello units 1 and 2, and Coletto Creek rather than install flue gas desulfurization controls is supported by the EPA's own Integrated Planning Model results (see TCEQ/PUCT comments on proposed BART FIP, page 5).

Furthermore, studies by ERCOT also indicate there is a likelihood of significant transmission reliability impacts if these units are retired with limited advance warning (ERCOT's 2016 Regional Transmission Plan Report, pages 22 – 24, available at:

http://www.ercot.com/content/wcm/lists/89476/2016_Regional_Transmission_Plan_-_Public_Version.zip).

The owners of generation resources in the ERCOT region are only required to give ERCOT at least 90 days notification before retiring or suspending operations of a generation resource. ERCOT also indicated that earlier notice by companies is unlikely. However, given the cumulative impact of the retirements, consequences to grid reliability would still be expected even with a significantly longer notification period. While this analysis included adding new generation to balance supply and demand, the retirement of these resources without adequate time to upgrade transmission facilities would result in reliability criteria violations (such as thermal overloads and low voltage conditions) on the transmission system serving the Dallas-Fort Worth area. ERCOT also indicates that a new major transmission project requires five years to be planned, routed, approved, and constructed.

The EPA should give serious consideration to these ERCOT studies for both the proposed BART FIP and remanded Reasonable Progress FIP, not only with regard to the potential reliability impacts but also with regard to the EPA's assumptions regarding cost effectiveness of the SO₂ controls relied upon in the FIPs.